

CLAIMS

- [cl001] 1. A curing light comprising:
- a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,
 - a light module,
 - said light module including a heat sink, said heat sink being configured to assist in heat dissipation,
 - a major well located in said heat sink,
 - a plurality of sub-wells located in said major well of said heat sink,
 - a plurality of light emitting semiconductor chips, said semiconductor chips being mounted in said sub-wells of said major well of said heat sink.
- [cl002] 2. A curing light as recited in claim 1 further comprising a plurality of primary heat sinks, at least some of said light emitting semiconductor chips being mounted to said primary heat sinks, and at least some of said primary heat sinks being mounted in said sub-wells of said major well.
- [cl003] 3. A curing light as recited in claim 1 further comprising a cover over said major well, said cover serving to protect said semiconductor chips, and said cover permitting light emitted by said semiconductor chips to pass through said cover.
- [cl004] 4. A curing light as recited in claim 1 further comprising a plurality of covers, at least some of covers located on at least some of said sub-wells, said covers serving to protect said semiconductor chips.
- [cl005] 5. A curing light comprising:
- an elongate heat sink with a proximal end and a distal end, said elongate heat sink having a longitudinal axis defined between said proximal end and said distal end,
 - a major well on said elongate heat sink distal end,
 - at least one sub-well within said major well,
 - at least one semiconductor chip capable of emitting light being mounted in said sub-well.

[cl006] 6. A curing light as recited in claim 5 wherein said chip is mounted in said sub-well by use of a heat conductive adhesive.

[cl007] 7. A curing light as recited in claim 5 wherein said chip is mounted in said sub-well by use of a light reflective adhesive.

[cl008] 8. A curing light as recited in claim 4 wherein at least one of said well and said sub-well has a wall that reflects light.

[cl009] 9. A curing light as recited in claim 8 wherein said wall includes a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, metal, plating and plastic.

[cl0010] 10. A curing light comprising:
an elongate heat sink with a proximal end and a distal end, said elongate heat sink having a longitudinal axis defined between said proximal end and said distal end,
a major well on said elongate heat sink distal end,
at least one sub-well within said major well,
at least one semiconductor chip module capable of emitting light being mounted in said sub-well.

[cl011] 11. A curing light comprising:
a secondary heat sink,
a major well in said secondary heat sink,
a semiconductor chip module affixed to said secondary heat sink in said major well, said semiconductor chip module including
a primary heat sink,
a semiconductor chip capable of emitting a light useful for curing composite materials mounted to said primary heat sink, and
a cover that provides protective covering for said semiconductor chip and which permits light emitted by said semiconductor chip to pass through it to provide light useful for curing composite materials.

[cl012] 12. A curing light as recited in claim 11 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl013] 13. A curing light comprising:
a wand adapted to be grasped by a human hand,
a battery power source located within said wand,
electronic control circuitry located within said wand,
a light module, said light module including an elongate heat sink with a proximal end and a distal end, said proximal end being proximate said wand, said elongate heat sink having a longitudinal axis, and elongate heat sink being adapted to draw heat away from a semiconductor located at said elongate heat sink distal end,
a mounting location located at said elongate heat sink distal end,
a semiconductor chip module located at said mounting location, said semiconductor chip module including
a primary heat sink mounted to said elongate heat sink at said mounting location,
a semiconductor chip capable of emitting light useful for curing light activated composite materials mounted to said primary heat sink, and
a cover that provides protective covering for said semiconductor chip and which permits light emitted by said semiconductor chip to pass through it to provide light useful for curing composite materials.

[cl014] 14. A curing light as recited in claim 13 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl015] 15. A curing light as recited in claim 13 further comprising a switch on said wand for initiating emission of light from said semiconductor chip.

[cl016] 16. A curing light as recited in claim 13 wherein said mounting platform is oriented so that when a light emitting semiconductor device is mounted on it,

light emitted by the light emitting semiconductor device will be emitted generally orthogonal to said elongate heat sink longitudinal axis.

[cl017] 17. A curing light as recited in claim 13 further comprising a well in said primary heat sink, said chip being located in said well, said well including a reflective wall, said reflective wall including a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, metal, plating and plastic.

[cl018] 18. A curing light as recited in claim 13 wherein said cover is selected from the group consisting of windows and focus lenses.

[cl019] 19. A curing light comprising:
a wand designed to be grasped by a human hand,
controls for initiating and terminating light transmission by the curing light,
circuitry in electrical connection with said controls,
a power source for powering the curing light,
a light module, said light module including:
a primary heat sink,
a major well on said primary heat sink,
a plurality of sub-wells in said major well,
light emitting semiconductor device, at least some of said light emitting semiconductor devices being mounted in said sub-wells.

[cl020] 20. A curing light as recited in claim 19 further comprising a secondary heat sink that is attached to said primary heat sink in order to assist in heat dissipation.